

WHAT IS CLAIMED IS:

1. A lead frame comprising:

a die-pad portion defined for a semiconductor element to be mounted;

5 a plurality of wire bonding portions arranged along a periphery of the die-pad portion within a region to be finally divided as a semiconductor device for the die-pad portion;

10 a plurality of land-like external terminal portions arranged in a region outside the wire bonding portions; and

15 a plurality of linear connection lead portions each integrally joining each of the wire bonding portions to a corresponding one of the external terminal portions,

wherein the die-pad portion, the wire bonding portions and the external terminal portions are supported by an adhesive tape.

20 2. The lead frame according to claim 1, wherein each of the connection lead portions is formed to be thinner than each of the wire bonding portions and each of the external terminal portions, and each of the wire bonding portions is formed to be as thick as each of the external terminal portions.

25 3. A lead frame comprising:

5 a plurality of wire bonding portions arranged within a region to be finally divided as a semiconductor device for a semiconductor element to be mounted, and along an outer periphery of the region;

10 a plurality of land-like external terminal portions arranged in a region inside the wire bonding portions; and

15 a plurality of linear connection lead portions each integrally joining each of the wire bonding portions to a corresponding one of the external terminal portions,

15 wherein the wire bonding portions and the external terminal portions are supported by an adhesive tape.

20 4. The lead frame according to claim 3, wherein each of the connection lead portions is formed to be thinner than each of the wire bonding portions and each of the external terminal portions, and each of the wire bonding portions is formed to be as thick as each of the external terminal portions.

25 5. A method of manufacturing a lead frame, comprising the steps of:

 forming a base frame by etching a metal plate, the base frame including a plurality of wire bonding

portions, a plurality of land-like external terminal portions and a plurality of linear connection lead portions arranged in a region between a die-pad portion and a frame portion for a semiconductor element to be mounted, said plurality of wire bonding portions being located along a periphery of the die-pad portion and joined to the die-pad portion, said plurality of external terminal portions being located outside the wire bonding portions and joined to each other, said plurality of connection lead portions each integrally joining each of the wire bonding portions to a corresponding one of the external terminal portions;

15 forming recess portions by half etching, in portions other than the die-pad portion, the wire bonding connection portions, the external terminal portions and the frame portion, of one surface of the base frame;

20 attaching an adhesive tape to the surface of the base frame where the recess portions are formed; and

25 cutting off portions joining the die-pad portion and the wire bonding portions, and portions joining the external terminal portions to each other, among the portions of the base frame where the recess portions are formed.

6. The method according to claim 5, further

comprising a step of forming a metal film on an entire surface of the base frame, after forming the recess portions, and before attaching the adhesive tape.

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7. A method of manufacturing a lead frame, comprising the steps of:

10 forming a base frame by simultaneously etching both surfaces of a metal plate using resists patterned into predetermined shapes, respectively, the base frame including a plurality of wire bonding portions, a plurality of land-like external terminal portions and a plurality of linear connection lead portions arranged in a region between a die-pad portion and a frame portion for a semiconductor element to be mounted, said plurality of wire bonding portions being located along a periphery of the die-pad portion and joined to the die-pad portion, said plurality of external terminal portions being located outside the wire bonding portions and joined to each other, said plurality of connection lead portions each integrally joining each of the wire bonding portions to a corresponding one of the external terminal portions, and

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25 simultaneously forming recess portions in portions other than the die-pad portion, the wire bonding connection portions, the external terminal portions

and the frame portion, of one surface of the base frame;

attaching an adhesive tape to the surface of the base frame where the recess portions are formed; and

5 cutting off portions joining the die-pad portion and the wire bonding portions, and portions joining the external terminal portions to each other, among the portions of the base frame where the recess portions are formed.

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8. The method according to claim 7, further comprising a step of forming a metal film on an entire surface of the base frame, after forming the recess portions, and before attaching the adhesive tape.

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9. A method of manufacturing a lead frame, comprising the steps of:

20 forming a base frame by etching a metal plate, the base frame including a plurality of wire bonding portions, a plurality of land-like external terminal portions and a plurality of linear connection lead portions arranged in a region surrounded by a frame portion for a semiconductor element to be mounted, 25 said plurality of wire bonding portions being located along an outer periphery of the region and joined to the frame portion, said plurality of

external terminal portions being located inside the
5 wire bonding portions and joined to each other, said
plurality of connection lead portions each
integrally joining each of the wire bonding portions
to a corresponding one of the external terminal
portions;

10 forming recess portions by half etching, in
portions other than the external terminal portions,
the wire bonding portions and the frame portion, of
one surface of the base frame;

15 attaching an adhesive tape to the surface of the
base frame where the recess portions are formed; and
cutting off portions joining the external
terminal portions to each other, among the portions
of the base frame where the recess portions are
formed.

20 10. The method according to claim 9, further
comprising a step of forming a metal film on an
entire surface of the base frame, after forming the
recess portions, and before attaching the adhesive
tape.

25 11. A method of manufacturing a lead frame,
comprising the steps of:

forming a base frame by simultaneously etching
both surfaces of a metal plate using resists

patterned into predetermined shapes, respectively, the base frame including a plurality of wire bonding portions, a plurality of land-like external terminal portions and a plurality of linear connection lead portions arranged in a region surrounded by a frame portion for a semiconductor element to be mounted, said plurality of wire bonding portions being located along an outer periphery of the region and joined to the frame portion, said plurality of external terminal portions being located inside the wire bonding portions and joined to each other, said plurality of connection lead portions each integrally joining each of the wire bonding portions to a corresponding one of the external terminal portions, and simultaneously forming recess portions in portions other than the external terminal portions, the wire bonding connection portions and the frame portion, of one surface of the base frame; attaching an adhesive tape to the surface of the base frame where the recess portions are formed; and cutting off portions joining the external terminal portions to each other, among the portions of the base frame where the recess portions are formed.

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12. The method according to claim 11, further comprising a step of forming a metal film on an

entire surface of the base frame, after forming the recess portions, and before attaching the adhesive tape.

- 5 13. A semiconductor device comprising:
 - a die-pad portion;
 - a plurality of wire bonding portions arranged along a periphery of the die-pad portion;
 - 10 a plurality of land-like external terminal portions arranged outside the wire bonding portions;
 - a plurality of linear connection lead portions each integrally joining each of the wire bonding portions to a corresponding one of the external terminal portions; and
 - 15 a semiconductor element mounted on the die-pad portion,
 - wherein each of electrode terminals of the semiconductor element is connected to a top surface of a corresponding one of the wire bonding portions by a bonding wire,
 - 20 the semiconductor element, the bonding wire, the wire bonding portions, the external terminal portions and the connection lead portions are sealed with sealing resin, and
 - 25 bottom surfaces of the external terminal portions are exposed to a surface of the sealing resin together with bottom surfaces of the wire

bonding portions.

14. The semiconductor device according to claim 13, wherein each of the connection lead portions is
5 formed to be thinner than each of the wire bonding portions and each of the external terminal portions, and each of the wire bonding portions is formed to be as thick as each of the external terminal portions.

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15. A semiconductor device comprising:
a plurality of wire bonding portions arranged along a periphery of the device;
a plurality of land-like external terminal portions arranged inside the wire bonding portions;
a plurality of linear connection lead portions each integrally joining each of the wire bonding portions to a corresponding one of the external terminal portions; and
20 a semiconductor element mounted on a required number of external terminal portions among said plurality of external terminal portions, while keeping isolated from the required number of external terminal portions,
25 wherein each of electrode terminals of the semiconductor element is connected to a top surface of a corresponding one of the wire bonding portions

by a bonding wire,

the semiconductor element, the bonding wire, the
wire bonding portions, the external terminal
portions and the connection lead portions are sealed
5 with sealing resin, and

bottom surfaces of the external terminal
portions are exposed to a surface of the sealing
resin together with bottom surfaces of the wire
bonding portions.

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16. The semiconductor device according to claim
15, wherein each of the connection lead portions is
formed to be thinner than each of the wire bonding
portions and each of the external terminal portions,
15 and each of the wire bonding portions is formed to
be as thick as each of the external terminal
portions.